# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Robin Cheung, et al.

Serial No.: 10/686,486

Confirmation No.: 8014

Filed:

October 15, 2003

For:

Apparatus for Electro
Chemical Deposition of
Copper Metallization with
the Capability of In-Situ
Thermal Annealing

MAIL STOP APPEAL BRIEF - PATENTS Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Dear Sir:

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Group Art Unit: 1742

Examiner:

Harry D. Wilkins, III

#### CERTIFICATE OF MAILING OR TRANSMISSION

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6/19/2007 Date

Nan Z. Carr

#### **REPLY BRIEF**

Applicants submit this Reply Brief to the Board of Patent Appeals and Interferences in response to the Examiner's Answer dated May 24, 2007. Please charge any additional fees that may be required to make this Appeal Brief timely and acceptable to Deposit Account No. 20-0782/APPM/003421.C2/KMT.

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# **Grounds of Rejection Withdrawn from Appeal**

Applicants withdraw the following grounds of rejection from appeal because the Examiner has withdrawn these rejections.

1. Claims 15 and 20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by *Dordi et al* (U.S. Patent No. 6,258,220, hereafter *Patent'220*), *Dordi et al* (U.S. Patent No. 6,635,157, hereafter *Patent'157*), *Dordi et al* (U.S. Patent Publication No. 2002/0029961, hereafter *Pub'961*), *Dordi et al* (U.S. Patent Publication No. 2004/0084301, hereafter *Pub'301*), and *Dordi et al* (U.S. Patent No. 6,267,853, hereafter *Patent'853*).

# Grounds of Rejection to be Reviewed on Appeal

- 1. Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yoshioka et al* (U.S. Patent No. 5,297,910, hereafter *Yoshioka*), in view of *Bleck et al* (U.S. Patent No. 5,980,706, hereafter *Bleck*) and *Uzoh et al* (U.S. Patent No. 6,123,825, hereafter *Uzoh*).
- 2. Claim 20 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yoshioka* in view of *Bleck, Shinbara* (U.S. Patent 6,155,275, hereafter *Shinbara*), and *Uzoh*.

#### **ARGUMENTS**

1. Argument regarding claim 15 which stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yoshioka*, in view of *Bleck* and *Uzoh*.

THE EXAMINER ERRED IN REJECTING CLAIM 15 UNDER 35 U.S.C. §103(a) BECAUSE THE COMBINED REFERENCES DO NOT TEACH OR SUGGEST ONE OR MORE THERMAL ANNEAL CHAMBERS IN CONNECTION WITH A MAINFRAME.

The Examiner indicates, in the Examiner's Answer (hereafter *Answer*), that Applicants argued *Uzoh* does not teach the structure of an annealing chamber and had admitted that thermal process chambers are well known in the specification (See *Answer* at page 6).

Applicants' prior argument was that even though *Uzoh* does teach a <u>process</u> involving an annealing step, *Uzoh* does not teach or suggest *combining* the structure that performs the annealing step with the structure that performs the previous steps. Applicants did not stress that *Uzoh* does not teach a specific anneal chamber.

The Examiner argues that it would have been obvious for one of ordinary skill in the art to incorporate all needed processing stations into a mainframe (See *Answer* at page 7).

Applicants respectfully submit that Examiner has not found references that teach or suggest one or more rapid thermal anneal chambers, or one or more thermal anneal chambers, in connection with a mainframe of an electro-chemical deposition system as set forth in claim 15. Absent some motivation or suggestion of the claimed subject matter, the Examiner uses impermissible hindsight in combining the elements of the three cited references.

2. Argument regarding claim 20 which stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yoshioka* in view of *Bleck, Shinbara*, and *Uzoh*.

THE EXAMINER ERRED IN REJECTING CLAIM 20 UNDER 35 U.S.C. §103(a) BECAUSE THE COMBINED REFERENCES DO NOT TEACH OR SUGGEST ONE OR MORE THERMAL ANNEAL CHAMBERS AND TWO OR MORE SPIN-RINSE-DRY CHAMBERS IN CONNECTION WITH A LOADING STATION.

Applicants respectfully traverse this rejection.

Yoshioka, Bleck, and Uzoh are described above. The combination of Yoshioka, Bleck, and Uzoh does not teach or suggest one or more thermal anneal chambers and two or more spin-ring-dry chambers in connection with a loading station, as set forth in claim 20.

Shinbara teaches a spin-rinse-dry station for cleaning wafers after processing. However, combination of Shinbara with Yoshioka, Bleck, and Uzoh does not teach or suggest one or more thermal anneal chambers and two or more spin-ring-dry chambers in connection with a loading station, as set forth in claim 20. Absent some motivation or suggesting of the claimed subject matter, the Examiner uses impermissible hindsight in combining the element of these four references together.

Therefore, *Yoshioka*, *Bleck*, *Shinbara* and *Uzoh*, alone or in combination, do not teach, show or suggest an electro-chemical deposition system, comprising a mainframe having a mainframe wafer transfer robots disposed therein, a loading station disposed in connection with the mainframe, wherein the loading station comprises one or more cassette receiving areas, two or more processing stations disposed in connection with the mainframe, wherein each processing station comprises two or more electrochemical deposition cells, and two or more post deposition treatment chambers in connection with the loading station, wherein the two or more post deposition treatment chambers comprise one or more thermal anneal chambers, and two or more spin-rinse-dry modules, and one or more loading station robots transfer wafers between the one or more cassette receiving areas and the two or more post deposition treatment chambers, as recited in claim 20.

In the Examiner's Answer dated May 24, 2007, the Examiner pointed out the "rapid thermal anneal chambers" was not cited in claim 20, only "thermal anneal chambers" was cited (See *Answer* at page 7).

Applicants respectfully submit that the term "rapid" was presented in the argument with respect of claim 20 due to clerical errors and has been removed from Applicants' argument shown above.

The Examiner further asserted that Applicants has argued that the claim term "in connection with" means "adjacent to", which is not supported by the specification (See *Answer* at page 8).

Applicants respectfully submit that the term "adjacent to" was first introduced by the Examiner, e.g. in page 6 of Final Office Action dated May 26, 2006, in describing *Uzoh*. "Adjacent" was used by Applicants only to address Examiner's view on *Uzoh*, not to interpret "in connection with", see page 11 of Appeal Brief filed January 22, 2007.

Additionally, even though Applicants did not use the term "adjacent" to describe the claimed subject matter, the term "adjacent" is nevertheless supported by the specification since "adjacent" items may or may not be in actual contact with each other (see attached Evidence from New Webster's New World Dictionary).

Applicants further submit that the usage of claim term "in connection with" is consistent in claims 15 and 20, and supported by the specification since "in connection with" may be construed as "directly or indirectly connected to".

#### CONCLUSION

For the reasons presented above, Appellants respectfully submit that the rejections over claims 15 and 20 are improper. Reversal of the rejections is respectfully requested.

Respectfully submitted,

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# **EVIDENCE APPENDIX**

1. Definition of "Adjacent" Excerpt from Webster's New World Dictionary.

Ad elline (ad"l in', -en') a feminine name: var. Adelina, Aline: see

ADELAIDE

aldemption (a demp'shen) n. [< L ademptio, a taking away < ad-, to + emere, take, buy: see REDEEM ] Law the extinction of a legacy by, or inferred from, an act of the testator before death, as by the disposal of the bequeathed property

Alden (äd'n, ād'n) 1 former British colony & protectorate in SW Arabia, on the Gulf of Aden: now part of the People's Democratic Republic of Yemen 2 seaport in this region and capital of the People's Democratic Republic of Yemen: pop. 264,000 3 Gulf of gulf of the Arabian Sea, between the S coast of Arabia and Somalia in E Africa in E Africa

adlen-(ad'n) combining form ADENO: used before a vowel [adenitis] Aldelnau-er (ad'n our; Ger a'den ou'er), Kon-rad (kän'rad'; Ger kon' rät') 1876-1967; Ger. statesman: chancellor of the Federal Republic

rät') 1876-1967; Ger. statesman: chancellor of the l'ederal Republic of Germany (1949-63)

ad-eļnine (ad'a nēn', -nin') n. [[Aden(o)- + -INE<sup>8</sup>]] a white, crystalline purine base, C<sub>5</sub>H<sub>8</sub>N<sub>b</sub>, contained in the DNA, RNA, and ADP of all tissue: it links with thymine in the DNA structure ad-eļni-tis (ad'n it'is) n. [[fol. + -ITIS]] glandular inflammation ad-eļno- (ad'n ō') [[< Gr adēn, gland: see INGUINAL]] combining form gland or glands [adenoma]

ad-eļno-car-ci-no|ma (-kār'sə nō'mə) n. [[prec. + CARCINOMA]] a malignant tumor of glandular origin or with a glandlike cell arrangement

ment
ad-e|noid (ad"n.cid', ad'noid') adj. [ADEN(0) + -OID] 1 glandlike or
glandular 2 of or like lymphoid tissue
ad-e|noidal (ad'n oid'l, ad noid'l) adj. 1 adenoid 2 having adenoids 3 having the characteristic difficult breathing or nasal tone that results from enlarged adenoids ad enoid ec to my (ad"n oid ek'to mē, ad'noi dek'-) n., pl. -mies the

ad enoids (ad'n oidz', ad'noidz') n.pl. growths of lymphoid tissue in the upper part of the throat, behind the nose: they can swell up, esp. during childhood, obstruct breathing and speaking, and cause chronic ear infections

ad eino ma (ad'n ô'mà) n. [ADEN(0)- + -OMA] a benign tumor of glandular origin or with a glandlike cell arrangement —ad'e|nom'|a tous (-ām'a təs) adj.
a|den|o-sine (a den'a sēn', -ṣin') n. [arbitrary blend < ADENINE +

RIBOSE a white, odorless, crystalline powder,  $C_bH_1N_5$ ,  $C_bH_9O_4$ , obtained from the hydrolysis of yeast nucleic acid: it is a nucleoside

tained from the hydrolysis of yeast nucleic acid: it is a nucleoside consisting of adenine and ribose: see also ADP, AMP, ATP adenosine diphos phate (di fas'fat') ADP adenosine tri phos phate (tri fas'fat') ATP adelno-sis. (ad'n o'sis). n., pl. -ses' (-sēz') any disease of glands; esp., the abnormal development of glandular tissue adelno-virus (ad'n ō vi'res) n. [[ADENO-+VIRUS]] any of a group of viruses that cause a variety of respiratory diseases in man adept (e dept'; also, & for n. usually, ad'ept') adj. [[L adeptus, pp. of adipisci, to arrive at < ad-, to + apisci, to pursue, attain: used in ML of alchemists claiming to have arrived at the philosopher's stone [] highly skilled; expert —n. ad'ept' an expert —a|dept'ly adv.—a|dept'ness n.

stone | highly skilled; expert — n. ad'ept' an expert — a|dept'ly adv. — a|dept'ness n.

ad e|quae (y (ad'i kwa sē) n. the quality or state of being adequate ad e|quate (ad'i kwa) adj. | L. adaequatus, pp. of adaequare < ad., to + aequare, to make equal < aequas, level, equal | 1 enough or good enough for what is required or needed; sufficient; suitable 2 barely satisfactory; acceptable but not remarkable — SYN. SUFFICIENT — ad'e|quate-ly adv. — advel enough of the strey of a tally like the strey of a tally li

ad extre-mum (ad' eks tre'məm) [L, at the extreme] 1 to or at the very end 2 at last; finally ad fin. [L ad finem] to the end; at the end ad here (ad hir', ad-) vi. -hered', -her'ing [L adhaerere < ad-, to + haerere, to stick] 1 to stick fast; stay attached 2 to stay firm in supporting or approving fto adhere to a leader, to adhere to a plan!—SYN. STICK—ad-her'ler n.
ad her ence (ad hir'əns, ad-) n. the act of adhering; specif., attachment (to a person cause ste) deuction and support

ment (to a person, cause, etc.); devotion and support

ad her ent (ad hir'ent, ed-) adj. [Fr < L adhaerens, prp. of adhaerers see ADHERE] 1 sticking fast; attached 2 Bot. grown together; adnate — n. a supporter or follower (of a person, cause, etc.) — SYN. FOLLOWER

adhe-sion (ad hē'zhən, əd-) n. [Fr < L adhaesio < pp. of adhaerere: see ADHERE ] 1 the act of sticking (to something) or the state of being stuck together 2 devoted attachment; adherence 3 a thing that adheres 4 Med. a) the joining together, by fibrous tissue, of bodily parts or tissues that are normally separate: it typically results from inflammation b) a band of fibrous tissue abnormally initial haddily and the second of the seco joining bodily parts or tissues 5 Physics the force that holds together the molecules of unlike substances whose surfaces are in

gener the molecules of uninke substances whose surfaces are in contact: distinguished from contacts.

ache-sive (ad he'siv, -ziv; ad-) adj. [Fr adhésif < L adhaesus, pp. of adhaerere: see ADHERE] 1 sticking and not coming loose; clinging 2 made so as to adhere —n. 1 an adhesive substance, as glue 2 Philately an adhesive postage stamp —ad-he'sive|y adv. —adhe'sive|see n.

he'sive ness n.

adhesive tape tape with a sticky substance on one side, variously

used, as for holding bandages in place ad hib; (ad hib'it) vt. [\ < L adhibitus, pp. of adhibere, to summon < ad , to + habere, to have ] [Rarel 1 to let in; admit 2 to afix 3 to administer, as a remedy —ad hibition (ad'he bish'en) n. ad hoc (ad häk', -hök') [L, to this] for this specific purpose; for a

special case only, without general application [an ad hoc commit-

ad homi-nem (ad ham's nem') [L, lit., to the man ] 1 appealing to prejudice and emotion rather than to reason 2 attacking the character, motives, etc. of an opponent rather than debating the issue

on logical grounds

adila-batic (ad'ē a bat'ik, ad'i a-) adj. [ < Gr adiabatos, not to be passed < a-, not + dia, through + bainein, to go: see COME ] Physics of a process that occurs without loss or gain of heat —adila bat'ji-

acting adv.

acting acting adv.

acting adv.

acting adv.

acting adv.

acting adv.

acting adv.

acting act

harmful nor helpful aldieu (a dyōō', -dōō', Fr à dyō') interj., n., pl. aldieus' or aldieus (a dyōōz', -dōōz', for 2d sp., Fr à dyō') [ME < OFr a dieu, to God (I commend you) < L ad, to + Deum, acc. of Deus, God; current use chiefly from modern Fr | goodbye; farewell Aldi-ge (a'dē jā') river in N Italy, flowing south & east into the Gulf of Venice: c. 250 mi. (400 km) [L, to infinity] endlessly; forever; without limit Abbrev. ad inf.

ad infinitium (ad' i nish'ē əm, -nish'əm) [L] at or to the beginning Abbrev. ad int.

Abbrev. ad inft.

ad in-te|rim (ad in'tə rim', -tər im) [L] 1 in the meantime 2 temporary Abbrev. ad int. —SYN. TEMPORARY

\*a|di-os (a'dē ōs', ā'-; Sp ā dyôs') interj. [Sp adiós < L ad + Deum: see ADIEU] goodbye; farewell

adli-po-cere (ad'a pō sir', -pə-) n. [Fr adipocire < L adeps (see fol.) + cera, wax] a fatty or waxy substance produced in decomposing dead bodies exposed to moisture

adli pose (ad'a pôs') adj. [ModL adiposus < L adeps (gen. adipis), fat; ult. < Gr aleipha, fat; akin to lipos: see LIPO.] of, like, or containing animal fat; fatty —n. fat in the connective tissue of an

adi pos ilty (ad'a pas'a tē) n. 1 the state of being fat; obesity 2 a

adii pos iity (ad'a päs'a tā) n. 1 the state of being fat; obesity 2 a tendency to become obese
Adii ron dack Mountains (ad'a rān'dak') mountain range in NE New York: highest peak, Mt. Marcy: also Adirondacks
adiit (ad'it) n. L aditus, pp. of adire, to approach < ad-, to + ire, to go: see ExIII an approach or entrance; specif., an almost horizontal passageway into a mine
adi 1 adjective 2 adjourned 3 adjustment
Adj Adjutant
adia centry (a jā'san sā) n. 1 the quality or atota of being add'.

Adj Adjutant
ad Ja-cenicy (a jā'sən sē) n. 1 the quality or state of being adjacent;
nearness 2 pl. -cies an adjacent thing
ad ja-cent (a jā'sənt) adj. [L adjacens, prp. of adjacere, to lie near <
ad-, to + jacere, to lie, throw: see JET'] near or close (to something);
adjoining —adja'cently adv.

SYN.—adjacent things may or may not be in actual contact with each
other, but they are not separated by things of the same kind fadjacent
angles, adjacent farmhouses; that which is adjoining something else
cuctines-it-at some-point or along a line fadjacining rooms; things are
contiguous when they touch along the whole or most of one side flooniting
ous farms; tangent implies contact at a single, nonintersecting point with
a curved line or surface fa line tangent to a circle); neighboring things lie
near to each other (neighboring villages)

adjacent angles two angles having the same vertex and a side in
common

common
ad-jec-ti-val (aj'ek ti'vəl, aj'ik-) adj. 1 of
an adjective 2 having the nature or function of an adjective 3 adjective-forming
lan adjectival suffix]—n. Linguis. a word
or word group that occurs in functions
typical of adjectives—adjec-ti'vally adv.
adjec-tive (aj'ik tiv) n. [ME & OFr adjective (aj'ik tiv) n. [ME & OFr adjective]

ADJACENT ANGLES

adjective (a) ik tiv) h. [ME & Off adjective] ADJACENT ANGLES jectify < L adjectivus, that is added < adjective, pp. of adjicere, to add to < adjective, pp. of adjicere, to add to < adjective, pp. of adjective, to any of a class of words used to modify a noun or other substantive [good, every, Aegean]—adj. 1 of an adjective 2 having the nature or function of an adjective 3 dependent or subordinate 4 Law of or relating to practice and procedure; procedural—ad'jective|y adv.

adjoin (ad join', a join', a-) vt. [ME ajoinen < OFr ajoindre < L adjungere < ad-, to (see AD-) + jungere: see Join ] 1 to be next to; be contiguous to 2 to unite or annex (to a person or thing) — vt. to be next to each other; be in contact

be next to each other; be in contact ad joining (-in) adj. touching at some point or along a line; contiguous — SYN. ADJACENT
ad journ (a jern') vt. [ME ajournen < OFr ajourner < a jorn, at the (specified) day < a, at + jorn, day < L diurnum, by day < diurnus, daily < dies, day; see DEITY; to put off or suspend until a future time /to adjourn a meeting/ — vi. 1 to close a session or meeting for a time /Congress adjourned for the summer/ 2 [Colloq.] to move from a place of meeting (to another place) /let's adjourn to the natio/ the patio/ SYN.—adjourn is applied to the action as of a deliberative body in bringing

SYM.—adjourn is applied to the action as of a deliberative body in bringing a session to a close, with the intention of resuming at a later date; proroque applies to the formal dismissal of a parliament by the crown, subject to reassembly; to dissolve an assembly is to terminate it as constituted, so that an election must be held to reconstitute it; postpone implies the intentional delaying of an action until a later time; suspend denotes the breaking off of proceedings, privileges, etc. for a time, sometimes for such an indefinite time as to suggest cancellation (to suspend a sentence)

ad journment (-ment) n. 1 an adjourning or being adjourned 2 the time of being adjourned

JUDG to se give ad-jupp. c ca'tc ad-ju-Law the s ad·jur ADJO esser subo Gran

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OF AMERICAN ENGLISH

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Editor in Chief

DAVID B. GURALNIK

Editor in Chief Emeritus



Webster's New World New York Dedicated to David B. Guralnik lexicographical mentor and friend

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